

GALL MIDGES IN AN AQUATIC OR SEMIAQUATIC ENVIRONMENT.

BY E. P. FELT,

ALBANY, N. Y.

It is difficult to draw a sharp line in the case of the gall midges, at least between those occurring under what might be termed an aquatic environment and those inhabiting a moist terrestrial environment. At the outset we would call attention to the following list of European gall midges occurring in what is probably an aquatic environment.¹

Perrisia inclusa Frfld., in sedge stalks.

Thurauia aquatica Rübs. in *Carex*.

Thurauia uliginosa Rübs. in *Carex*.

Lasioptera arundinis Schin. in reed stems.

Lasioptera flexuosa Winn. in reed stems.

There are in addition to the above, a number of other European species which have been reared from *Carex* and other water-loving plants. These, in case any one be specially interested, are listed in Les Zoocécidies des Plantes d'Europe et du Bassin de la Méditerranée, Vols. 1 and 2, by Dr. C. Houard.

Comparatively few American species have been reared from aquatic or semiaquatic plants. The European records for the Cyperaceæ include four genera and nine species, while in this country only two genera and two species have been reported from members of this family. There is good reason for believing that a number of species of *Hormomyia* live at the expense of plants belonging to this natural order. Here is an excellent field for one wishing to undertake profitable biological work. The following is a list of American species reared from aquatic or semiaquatic plants.

Rhabdophaga cephalanthi Felt, reared from twig galls on button-bush, *Cephalanthus*.

Cecidomyiid larvæ have been recorded from the leaves of water-hemlock, *Cicuta*.

Thecodiplosis dulichii Felt was reared from the fruit of *Dulichium*.

¹ 1910, Die Süßwasserfauna Deutschlands Heft 2 a, Diptera, by K. Grünberg, pp. 16-20.

Neolasioptera hibisci Felt inhabits the swollen stems of the swamp rose mallow, *Hibiscus moscheutos*.

Itonida taxodii Felt produces a conical, globular or elongate deformation of the leaf of the bald cypress, *Taxodium*.

Thecodiplosis ananassi Riley causes a fusiform twig gall on the bald cypress, *Taxodium*.

Many willows occur in aquatic or semiaquatic environment. A list of the numerous galls occurring upon the different willows is given in Economic Entomology, Journal, 4: 468-69. There are doubtless in this list, extending from pages 451 to 475, a few other species which have been reared from plants normally growing in an aquatic or semiaquatic environment.

TABANIDÆ AS INHABITANTS OF THE HYDROPHYTIC AREA.

BY RAYMOND C. OSBURN,

NEW YORK, N. Y.

All Tabanidæ undergo the larval stage in water and so belong at this time to the hydrophyte fauna, no matter how far afield the adults may roam in search of food. As the males do not attack animals they usually do not wander far and must usually be collected by sweeping the grass at the edges of the streams and swamps where the females naturally return to lay their eggs after feeding. The eggs are usually laid on the stems of grasses over the water and after hatching the young fall into the water. The writer has observed the female of *Chrysops flavidus* "dipping" over the water and occasionally touching it with the tip of the abdomen after the manner of many dragonflies, but whether eggs were being deposited in the water during this performance is not known. If so it is the only case known in this group where the eggs are deposited in the water.

The exact relations of the larvæ of Tabanidæ to special kinds of aquatic surroundings have not been carefully studied, but some notes and personal observations are at hand which indicate that some variation exists in this matter. A fairly satisfactory clue to the larval habitat is found in the occurrence of the males, which in ordinary cir-